Name: Date:

Polynomial Factoring solution (version 666)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 27 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(27)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 108}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-72}}{2}$$

$$x = \frac{6 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{6 \pm 6\sqrt{2}\, i}{2}$$

$$x = 3 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 + 4i$ and $-6 + 7i$ in standard form $(a + bi)$.**

Solution

$$(-3 + 4i) \cdot (-6 + 7i)$$

$$18 - 21i - 24i + 28i^2$$

$$18 - 21i - 24i - 28$$

$$18 - 28 - 21i - 24i$$

$$-10 - 45i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 13x + 10$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	2	-13	10
2		2	8	-10
	1	4	-5	0

$$f(x) = (x-2)(x^2+4x-5)$$

$$f(x) = (x-2)(x-1)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+1)^2 \cdot (x-2)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.